DOCUMENT RESUME

ED 252 549 TM 840 808

AUTHOR Nerenz, Anne G.; And Others
TITLE Scaling and Summary Statistics for the Curriculum Implementation and Program Customizing Variables. Comparative Study of Phase IV IGE Evaluation Project. Phase IV, Project Paper 80-6.
INSTITUTION Wisconsin Univ., Madison. Research and Development Center for Individualized Schooling.
SPONS AGENCY National Inst. of Education (ED), Washington, DC.
PUB DATE Aug 80
GRANT OB-NIE-G-80-0117
NOTE 30p.; For related documents, see TM 840 804-812 and TM 850 019.
PUB TYPE Reports - Research/Technical (143) -- Tests/Evaluation Instruments (160)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Curriculum Evaluation; Elementary Education; Grade 2; Grade 5; *Individualized Instruction; *Mathematics Instruction; Programed Instruction; *Program Implementation; Questionnaires; *Reading Instruction; Student Needs
IDENTIFIERS Developing Mathematical Processes; *Individually Guided Education; Prereading Skills Program; Wisconsin Design for Reading Skill Development

ABSTRACT

This is one of a series of reports which provide definitions of and descriptive data on the variables used in the Comparative Study of Phase IV of the Individually Guided Education (IEG) Evaluation Project. Phase IV investigated three curriculum programs specifically designed to be compatible with instructional programming for the individual student: (1) the Wisconsin Design for Reading Skills Development (WDRSD); (2) Developing Mathematical Processes (DMP); and (3) Prereading Skills (PRS). Information on instructional methods and pupil outcomes for grades 2 and 5 was collected from achievement monitoring and domain referenced tests, teacher logs, and classroom observations. Information on background, organizational, and program variables came from questionnaires completed during structured interviews with principals, unit leaders, and teachers. This report focuses on two aspects of curriculum program use: Curriculum Implementation, a measure of the degree to which WDRSD or DMP is implemented; and Program Customizing, a measure of the extent to which the curriculum in use is altered to meet individual children's needs. A list of questionnaire items from which the variable was developed, a detailed explanation of the scaling procedures, and a description of the distribution of the variables are provided. (Author/BS)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED252549

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
This document has been reproduced as received from the person or organization originating it.
Minor changes have been made to improve reproduction quality.
Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

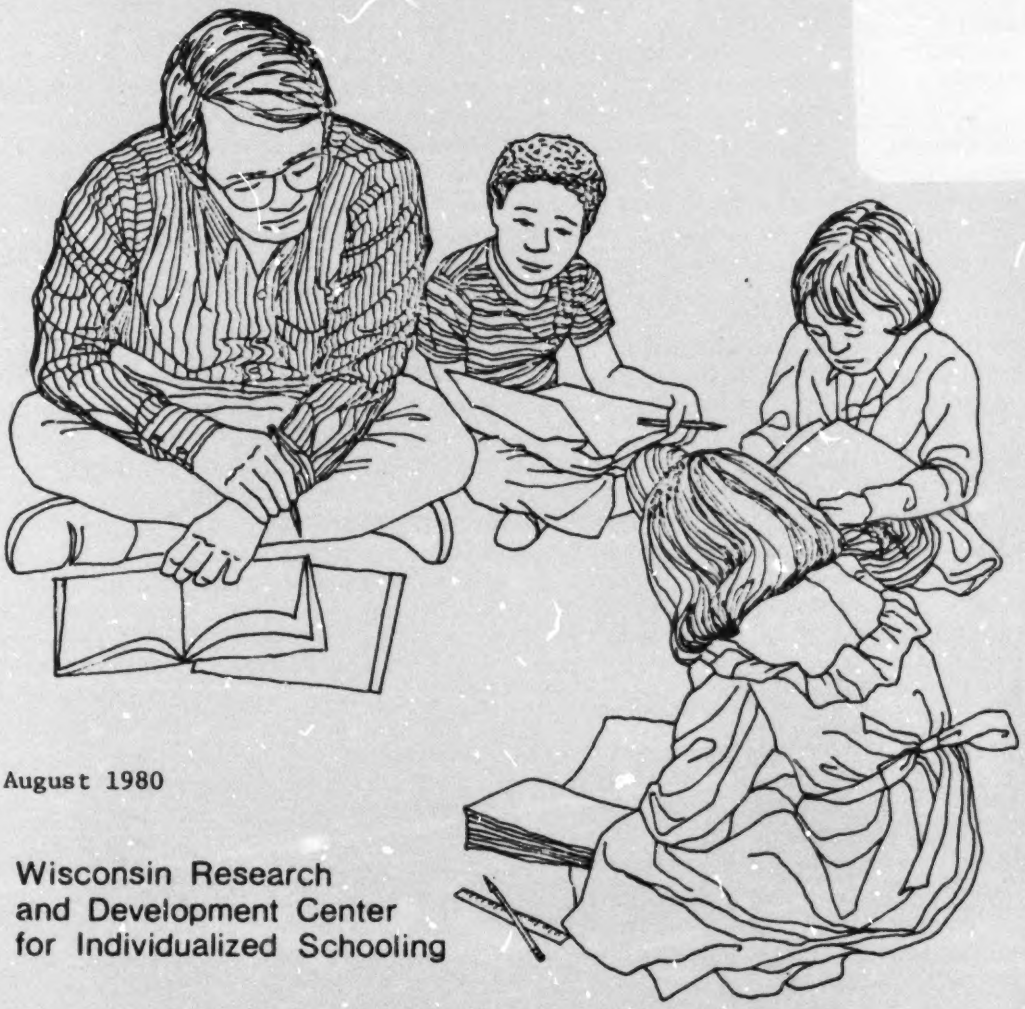
Phase IV

Project Paper 80-6

SCALING AND SUMMARY STATISTICS FOR THE CURRICULUM IMPLEMENTATION AND PROGRAM CUSTOMIZING VARIABLES

COMPARATIVE STUDY OF PHASE IV IGE EVALUATION PROJECT

by Anne G. Nerenz, Deborah M. Stewart and Norman L. Webb



August 1980

Wisconsin Research
and Development Center
for Individualized Schooling

TM 840 808

Phase IV

Project Paper 80-6

SCALING AND SUMMARY STATISTICS FOR THE CURRICULUM IMPLEMENTATION AND PROGRAM CUSTOMIZING VARIABLES

COMPARATIVE STUDY OF PHASE IV IGE EVALUATION PROJECT

by

Anne G. Nerenz
Deborah M. Stewart
Norman L. Webb

Report from the
IGE Evaluation Project

Thomas A. Romberg
Work Group Chairman

Wisconsin Research and Development Center
for Individualized Schooling
The University of Wisconsin-Madison
Madison, Wisconsin

August 1980

Published by the Wisconsin Research and Development Center for Individualized Schooling. The project presented or reported herein was performed pursuant to a grant from the National Institute of Education, Department of Health, Education, and Welfare. However, the opinions expressed herein do not necessarily reflect the position or policy of the National Institute of Education, and no official endorsement by the National Institute of Education should be inferred.

Center Grant No. OB-NIE-C-80-0117

BEST COPY AVAILABLE

MISSION STATEMENT

The mission of the Wisconsin Research and Development Center is to improve the quality of education by addressing the full range of issues and problems related to individualized schooling. Teaching, learning, and the problems of individualization are given concurrent attention in the Center's efforts to discover processes and develop strategies and materials for use in the schools. The Center pursues its mission by

- conducting and synthesizing research to clarify the processes of school-age children's learning and development
- conducting and synthesizing research to clarify effective approaches to teaching students basic skills and concepts
- developing and demonstrating improved instructional strategies, processes, and materials for students, teachers, and school administrators
- providing assistance to educators which helps transfer the outcomes of research and development to improved practice in local schools and teacher education institutions

The Wisconsin Research and Development Center is supported with funds from the National Institute of Education and the University of Wisconsin.

WISCONSIN RESEARCH AND DEVELOPMENT
CENTER FOR INDIVIDUALIZED SCHOOLING

Table of Contents

	Page
List of Tables	vii
List of Figures	vii
Abstract	ix
I. Introduction	1
II. Scaling of Program Use Variables	3
Definitions	3
Curriculum Implementation Scaling	3
WDRSD	3
DMP	6
Program Customizing Scaling	7
III. Summary Statistics for the Scaled Variables	9
References	15
Appendix: Items for WDRSD/Reading and DMP/Math Program Use Variables	17

List of Tables

Table		Page
1	Summary Statistics for Program Use Variables	9

List of Figures

Figure		Page
1	Distribution of Curriculum Implementation Scores . .	11
2	Distribution of Program Customizing Scores	13

Abstract

This report is one in a series of papers which provide definitions of and descriptive data on the variables used in the Comparative Study of Phase IV of the IGE Evaluation Project. Specifically, it focuses on two aspects of curriculum program use: Curriculum Implementation, a measure of the degree to which the Wisconsin Design for Reading Skill Development (WDRSD) or Developing Mathematical Processes (DMP) is implemented, and Program Customizing, a measure of the extent to which the curriculum in use is altered to meet individual children's needs. Verbal definitions, a list of questionnaire items from which the variable was developed, a detailed explanation of the scaling procedures, and a description of the distribution of the variables are provided.

I

Introduction

The IGE Evaluation Project has as a central objective the identification of features of IGE schooling which contribute to successful instruction, especially in reading skills and mathematics (Romberg, 1976). Although the first four phases of this project focused on different aspects of IGE, they were designed to provide complementary data bases resulting in a comprehensive description of this form of schooling. With this goal in mind Phase IV was designed to supplement information collected in Phases I and III by providing detailed information on a small number of curricular and instructional variables. That is, whereas these phases investigated organizational, system, general means of instruction, and general achievement variables, the main purpose of Phase IV was to investigate the three R & D Center-produced curriculum programs whose instructional procedures and materials were specifically designed to be compatible with instructional programming for the individual student. These programs are the Wisconsin Design for Reading Skills Development (WDRSD), (Otto, 1977); Developing Mathematical Processes (DMP), (Romberg, 1977); and Prereading Skills (PRS), (Venezky & Pittelman, 1977).

Phase IV was divided into two parts--the Descriptive Study and the Comparative Study--and information on the design and procedures used during each portion may be found in Project Papers 79-42 (Webb & Romberg, 1979) and 80-2 (Romberg, Webb, Stewart, and Nerenz, 1980). Briefly, each

part was designed to provide detailed information on two variables--means of instruction and pupil outcomes--using achievement monitoring and domain referenced tests, teacher logs, and classroom observations. In addition, a smaller amount of information on background, organizational, and program variables was obtained from questionnaires completed during structured interviews with principals, unit leaders, and teachers. This information is used as the basis of the six variables, considered in paper 80-7 (Nerenz, Stewart, and Webb), and the program use variables which are examined in this paper.

II
Scaling of Program Use Variables

DEFINITIONS

The Curriculum Implementation variable is a measure of the extent to which WDRSD or DMP is used. Both WDRSD and DMP were designed to be compatible with IGE's Instructional Programming Model; that is, each product includes instructional objectives, related evaluation procedures, record-keeping procedures, and suggested instructional activities in sufficient variety that instruction may be adapted to student characteristics. Users of WDRSD or DMP may choose to use all parts of the program or only selected elements; users may also choose to use other products in the same curriculum area jointly or with one product supplemental to the other(s).

Program Customizing is a measure of alterations made to meet the specific needs of individual students. It includes subscores for program adaptation, provision for review and reinforcement, and teacher development of materials.

CURRICULUM IMPLEMENTATION, SCALING

For both programs, the maximum number of points is 10.

WDRSD

The score provides an indication of the extent to which the different elements of the WDRSD program are used and the way in which they are implemented. Although points are assigned differently at

grades 2 and 5, the number of possible points is the same at each grade level.

Word Attack Implementation

Points		
Grade 2	Grade 5	
15	2	As the basis for word attack skill instruction.
5	1	To monitor word attack skill development after instruction in the regular reading program, such as the basal reader program.
15	3	As the basis for instruction and to monitor skill development.

Study Skills Implementation

Points		
Grade 2	Grade 5	
6	12	Form skill groups and instruct Study Skills within the content areas.
6	8	Form skill groups and alternate instruction of Study Skills with instruction in Comprehension skills within the reading block.
2	4	Form skill groups and alternate instruction of Study Skills with instruction of Word Attack skills within the reading block.
6	8	Form skill groups and instruct Study Skills during a special skill period set aside for Study Skill instruction
4	8	Form skill groups and alternate instruction of Study Skills with instruction in Self-Directed, Interpretive, and Creative Reading skills.

Comprehension Implementation

Points		
Grade 2	Grade 5	
2	4	Form skill groups and alternate instruction of Comprehension skills with instruction of Word Attack skills within the reading block.
4	12	Form skill groups and instruct Comprehension skills within the reading block every day.
4	12	Form skill groups and instruct Comprehension skills outside of the reading block every day.
6	8	Form skill groups and alternate instruction of Comprehension skills with instruction of Study Skills within the reading block.
4	8	Form skill groups and alternate instruction of Comprehension skills with instruction of Self-Directed, Interpretive, and Creative Reading skills within the reading block.
6	12	Form skill groups and instruct Comprehension skills within the content areas.
2	4	Alternate skill instruction in all skill areas.

Other Implementation

Points		
Grade 2	Grade 5	
1	1	Implementation of Self-directed, Interpretive, or Creative reading.
2	2	Use of the published list of materials in each folder of the Teacher's Resource File.

TOTAL SCORE

Since multiple responses were possible for the Study Skills and Comprehension elements, points for those elements were summed to a number no larger than the maximum number of points assigned for any single type of implementation. Then, scores for each teacher were summed across all elements to a maximum of 30 points and divided by 3 for scores ranging from 0 to 10. An average score was calculated for each school.

Those respondents who provided information only on the number of WDRSD elements which were implemented rather than on the number of elements and the manner in which they were implemented were assigned the smallest number of points for each element, thus receiving a total of 9.

DMP

This variable measures the degree to which DMP is being implemented. Points were assigned for Grades 2 and 5 as follows:

Main or supplementary program (1 to 6 points):

6 points	DMP is the main program or it is the main program with supplementary materials added.
3 points	DMP and another program are used jointly.
1 point	DMP is used as a supplementary program.

DMP Materials (0 to 3 points)

2 points	The resource manual is used.
1 point	At least two other types of materials such as workbooks, student guides, manipulatives, and games are used.

Pupil performance card (0 or 1 point)

1 point Pupil performance cards are used.

The number of points were summed for each teacher, and then averaged across teachers within each school.

PROGRAM CUSTOMIZING SCALING

This variable measures the extent to which a Grade 2 or Grade 5 reading or mathematics program has been customized. Three aspects of customization were measured: adaptations to children's instructional needs, provision for review and reinforcement, and teacher development of materials.

Adaptations. Adaptations were defined as changes, additions, and deletions in the curriculum program and two facets of program adaptations were considered. The first is whether the program is adapted to meet instructional needs. The second is whether the existence of multiple instructional programs leads to duplication of instruction.

Meeting Instructional Needs (0 or 5 points)

	Adaptation
5 points	At least one reported adaptation reflected attention to children's individual needs. (Responses 1,2, 3,4,6,7,10,11,12,13,16)

Duplication of Instruction (-3 or 0 points)

	Adaptation
-3 points	More than one instructional program is used and duplicate instruction is provided or more than one instructional program is used but the programs do not complement each other.

Points ortained for these two responses reflecting program adaptations were summed for each teacher.

Provision for Review and Reinforcement. In that skills which are taught in relative isolation should be both reinforced in different settings and reviewed as the basis of subsequent instruction, provisions for review and reinforcement were considered to be an essential aspect of program use. Due to differences in the math and reading skills questionnaires, different responses were used in determining whether 3 points were assigned.

Math

Teacher Response

Provisions are made for application and continuation of skills during math class.

Reading

At least one of the following:

a) provisions for reviewing skills in other content areas

b) application and continuation of skills

c) scheduling of formal skill/review sessions

d) frequent teaching and reinforcement of reading skills during instruction in other areas

Teacher development of materials. One point was assigned for each teacher reporting preparation of special materials.

Composite score. Subscores were summed for each teacher and averages were calculated for each school. Possible values range from -3 to 9.

III

Summary Statistics for the Scaled Variables

The scaled program use variables are described in Table 1 in terms of the mean, standard deviation, actual maximum and minimum values obtained, and logical maximum and minimum values obtainable. Number of schools responding to the questionnaries is also shown. Figures 1 and 2 show histograms of the scaled variables.

TABLE 1

Summary Statistics for Program Use Variables

Variable	No. of schools	Mean	Standard deviation	Obtained maximum	Obtained minimum	Logical maximum	Logical minimum
Curriculum Implementation							
WDRSD	11	4.545	3.314	9.25	0.00	10	0
DMP	8	5.250	4.743	10.00	0.00	10	0
Program Customizing							
Reading study	11	1.705	.974	4.00	.50	9	-3
Math study	8	1.250	.926	3.50	.50	9	-3
Total sample	19	1.513	.956	4.00	.50	9	-3

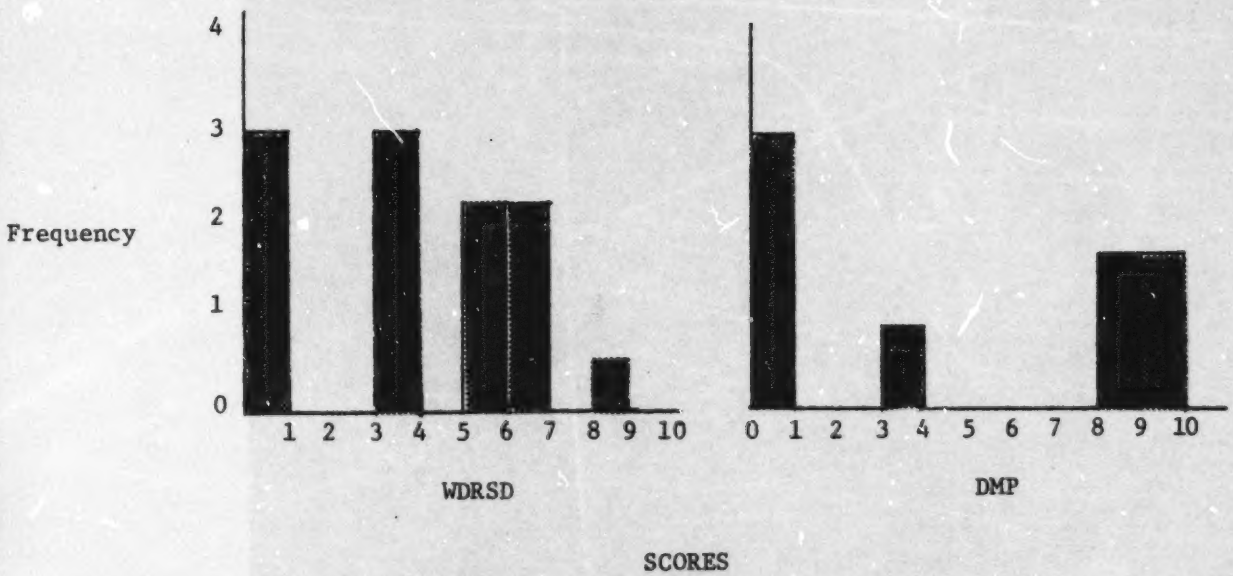


Figure 1. Distribution of Curriculum Implementation Scores

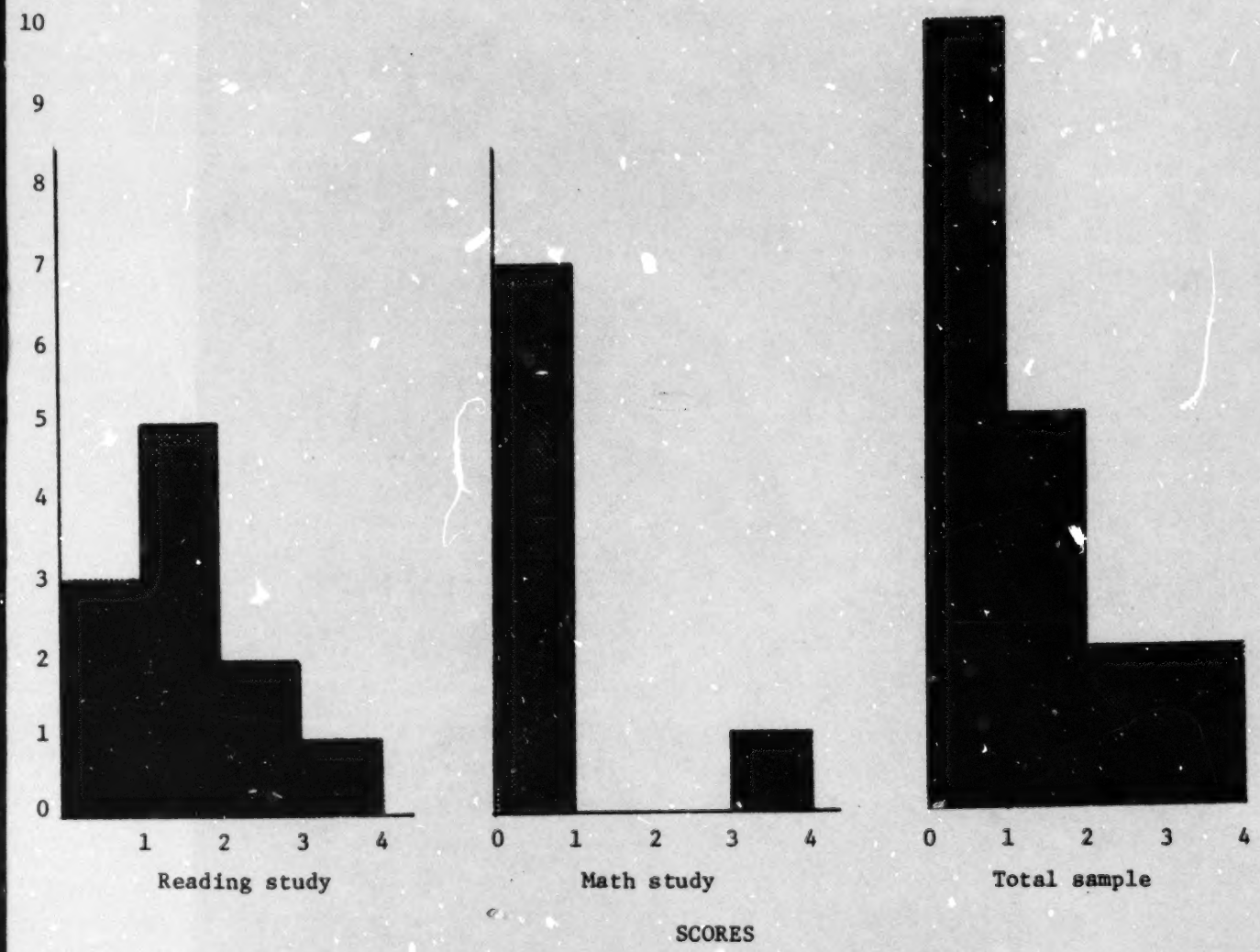


Figure 2. Distribution of Program Customizing Scores

References

Nerenz, A. G., Stewart, D. M, & Webb, N. L. Information Collected in the Comparative Study of Phase IV of the IGE Evaluation Project on Background Variables. Project Paper 80-7. Madison: Wisconsin Research and Development Center for Individualized Schooling, 1980.

Otto, W. The Wisconsin Design: A reading program. In H. J. Klausmeier, R. A. Rossmiller, & M. Saily (Eds.), Individually guided education: Concepts and practices. New York: Academic Press, 1977.

Romberg, T. A. IGE Evaluation: Perspectives and a Plan. Working Paper No. 183. Madison: Wisconsin Research and Development Center for Cognitive Learning, 1976.

Romberg, T. A. Developing Mathematical Processes: The elementary mathematics program for Individually Guided Education. In H. J. Klausmeier, R. A. Rossmiller, & M. Saily (Eds.), Individually guided education: Concepts and practices. New York: Academic Press, 1977.

Romberg, T. A., Webb, N. L., Stewart, D. M., & Nerenz, A. G. Design for the Comparative Study of Reading Skills and Mathematics Curriculum Products of Phase IV of the IGE Evaluation Project. Project Paper 80-2. Madison: Wisconsin Research and Development Center for Individualized Schooling, 1980.

Venezky, R. L, & Pittelman, S. P. PRS: A Prereading Skills Program for Individually Guided Education. In H. J. Klausmeier, R. A. Rossmiller, & M. Saily (Eds.), Individually guided elementary education: Concepts and practices. New York: Academic Press, 1977.

Webb, N. L., & Romberg, T. A. The Design for the Study of Reading Skills and Mathematics Curriculum Products IGE Evaluation Project--Phase IV. Project Paper 79-42. Madison: Wisconsin Research and Development Center for Individualized Schooling, 1979.

APPENDIX

Items for WDRSD/Reading and DMP/Math Program Use Variables

In this appendix, items are labeled so that the first letter identifies the questionnaire respondent (see below) and the remaining letters and numbers give the location of the item in the original questionnaire. In that the math and reading teacher questionnaires were similar, teachers were asked to respond only to the questionnaire relevant to the study in which their school participated.

First letter	Respondent
P	principal
U	unit leader
R	teacher, reading
M	teacher, math

WDRSD IMPLEMENTATION

R02A1 If WDRSD is among the programs being used, then:

Which elements are used? (All may apply; ✓ = 1, blank = 0)

____ Word Attack
____ Study Skills
____ Comprehension
____ Self-Directed Reading
____ Interpretive Reading
____ Creative Reading

R02A2 If the Word Attack Element is implemented:

Which one statement applies to your implementation of the Design Word Attack Element:

(1) as the basis for word attack skill instruction.
(2) to monitor word attack skill development after instruction in the regular reading program, such as the basal reader program.
(3) I haven't worked with it for a number of years.
(4) combination of 1 and 2.

R02A3 If the Study Skills Element is implemented, check the procedure or procedures that best describe implementation of the Study Skills Element in your unit (class or grade level).

___ 1. Form skill groups and instruct Study Skills within the content areas.
___ 2. Form skill groups and alternate instruction of Study Skills with instruction of Comprehension skills within the reading block.
___ 3. Form skill groups and alternate instruction of Study Skills with instruction of Word Attack skills within the reading block.
___ 4. Form skill groups and instruct Study Skills during a special skill period set aside for study skill instruction.
___ 5. Form skill groups and alternate instruction of Study Skills with instruction in Self-Directed, Interpretive, and Creative Reading skills.

R02A4 If the Comprehension Element is implemented:

Check the procedure or procedures that best describe implementation of the Comprehension Element in your unit (class or grade level).

___ 1. Form skill groups and alternate instruction of Comprehension skills with instruction of Word Attack skills within the reading block.
___ 2. Form skill groups and instruct Comprehension skills within the reading block every day.
___ 3. Form skill groups and alternate instruction of Comprehension skills with instruction of Study Skills within the reading block.
___ 4. Form skill groups and alternate instruction of Comprehension skills with instruction of Self-Directed, Interpretive, and Creative Reading skills within the reading block.
___ 5. Form skill groups and instruct Comprehension skills within the content areas.
___ 6. Alternate skill groups.

R04B1 Do you use the list of published materials in each folder of the Teacher's Resource File?

(0) No
(1) Yes

DMP IMPLEMENTATION

M02B If DMP is among the programs being used, then which one statement applies to your implementation of the program?

(1) DMP is used as the main math program.
(2) DMP is used as the main math program but is supplemented by some teacher-made materials.
(3) DMP and another math program are used jointly.
(4) DMP is used as supplementary material for some other math program.

M02G What materials from the DMP program do you use?

____ resource manual
____ workbooks
____ student guides
____ manipulatives
____ games

M06DA Do you use pupil-performance cards?

(0) No
(1) Yes

INSTRUCTIONAL PROGRAM CUSTOMIZATION

ADAPTATIONS TO CHILDREN'S INSTRUCTIONAL NEEDS

R05B1 Have you adapted (changed/added/deleted) the WDRSD (reading) skills program to fit your specific needs?

(0) No
(1) Yes

M05B1 Have you adapted (changed/added/deleted) the DMP (math) program to fit your specific needs?

(0) No
(1) Yes

R05B2 If yes, what adaptations have you made? (Possible three adaptations reported.)

(01) only teach skills child needs and reinforcement
(02) added individualized kit
(03) teacher thought of easier approach than provided by text
(04) supplement with materials at school or teacher-made including games
(05) one teacher has become WDRSD Coordinator
(06) teacher read some Level C test questions instead of children reading them
(07) have combined some skills; added some library exercises
(08) we have deleted
(09) teacher tries not to teach syllogistic reasoning; they get all goofed up, just do some sheets
(10) Study Skills; added some materials
(11) Had to gather extra materials to meet needs of students for Comprehension Skills
(12) Changed games to worksheets, worksheets to games
(13) Thought up some more activities for skills taught in WDRSD
(14) For lower kids with reading problems in Word Attack, criteria to pass most skills is inappropriate
(15) Deleted schwa D level and accents

M05B2 If yes, what adaptations have you made?

(01) only teach skills child needs and reinforce
(02) add individualized kit
(03) teacher thought of easier approach than provided by text
(04) supplement with materials at school, including games or teacher-made materials
(05) one teacher has become DMP coordinator
(07) have combined some skills
(08) we have deleted
(11) had to gather extra materials to meet needs of students, drill sheets
(12) changed games to worksheets; worksheets to games
(13) thought up some more activities for skills taught
(16) added a unit
(17) teacher has to read much of DMP with kids. They fail to see humor in problems and names.
(18) on Topic 37, left out grouping part (review) and kids did much better

R02C1 If more than one reading program is noted above, then

Do the programs have overlapping content?

(0) No
(1) Yes

If yes, are students routinely given "duplicate" instruction?

(0) No
(1) Yes

R02B2 How do the programs complement each other?

(1) They teach and reinforce the same basic skills but with different approaches, in different ways.
(2) Use same terminology in multiple areas
(3) Both use systematic building of skills approach
(4) They learn the basic skills in reading program and Design; projects let them apply skills
(5) They don't!
(6) They both work toward skills in comprehension
(7) Teacher adds own creative materials to better implement program.

M02C1 If more than <u>one</u> math program is noted above, then

M02C1 Do the programs have overlapping content?

(0) No
(1) Yes

If <u>yes</u>, are students routinely given "duplicate" instruction?

(0) No
(1) Yes

M02B2 How do the programs complement each other?

(1) They teach and reinforce some basic skills but with different approaches
(2) Use same terminology
(3) Both use systematic building of skills approach
(4) Use commercial text to supplement design, fill in holes or for more practice
(5) They don't!

PROVISION FOR REVIEW AND REINFORCEMENT

R02B3 What provisions are made for review or reinforcement of skills taught in each program?

(1) Up to the teacher; can refer to WDRSD when skills come up in basal
(2) Posttests
(3) Workbooks
(4) Map skills and other projects in other areas
(5) Some overlapping; review of skills in other content areas
(6) Application and continuation of skills during reading block or other subject areas
(7) With WDRSD, if they don't master a skill they have to do it again
(8) No formal provisions are made
(9) Followed up by next level

R02F4 Do you ever schedule formal skill sessions to review skills students have mastered?

(0) No
(1) Yes

R02F5 To what extent do you teach or reinforce reading skills during instruction in other content areas (i.e., social studies, science)?

(0) Not at all
(1)
(2) Sometimes
(3) Quite a bit
(4) Continuously and consciously

M02C3 What provisions are made for review or reinforcement of objectives taught in each program?

(1) do review sheets or more pages in text
(2) posttests
(6) application and continuation of skills during math class
(8) no formal provisions made

TEACHER DEVELOPMENT OF MATERIALS

R03A Have you prepared any special materials for use in your WDRSD (reading) skill group?

(0) No
(1) Yes

M03A Have you prepared any special materials for use in your math groups?

(0) No
(1) Yes

Center Planning and Policy Committee

Richard A. Rossmiller
Wayne Otto
Center Co-Directors

Dale D. Johnson
Area Chairperson
Studies in Language:
Reading and Communication

Marvin J. Fruth
Area Chairperson
Studies in Implementation
of Individualized Schooling

Penelope L. Peterson
Area Chairperson
Studies of Instructional Programming
for the Individual Student

James M. Lipham
Area Chairperson
Studies of Administration and
Organization for Instruction

Thomas A. Romberg
Area Chairperson
Studies in Mathematics and Evaluation
of Practices in Individualized Schooling

Associated Faculty

Vernon L. Allen
Professor
Psychology

B. Dean Bowles
Professor
Educational Administration

Thomas P. Carpenter
Associate Professor
Curriculum and Instruction

W. Patrick Dickson
Assistant Professor
Child and Family Studies

Lloyd E. Frohreich
Associate Professor
Educational Administration

Marvin J. Fruth
Professor
Educational Administration

Dale D. Johnson
Professor
Curriculum and Instruction

Herbert J. Klausmeier
V.A.C. Henmon Professor
Educational Psychology

Joel R. Levin
Professor
Educational Psychology

James M. Lipham
Professor
Educational Administration

Dominic W. Massaro
Professor
Psychology

Donald M. McIsaac
Professor
Educational Administration

Wayne Otto
Professor
Curriculum and Instruction

Penelope L. Peterson
Assistant Professor
Educational Psychology

Thomas S. Popkewitz
Professor
Curriculum and Instruction

Gary G. Price
Assistant Professor
Curriculum and Instruction

W. Charles Read
Professor
English and Linguistics

Thomas A. Romberg
Professor
Curriculum and Instruction

Richard A. Rossmiller
Professor
Educational Administration

Peter A. Schreiber
Associate Professor
English and Linguistics

B. Robert Tabachnick
Professor
Curriculum and Instruction

Gary G. Wehlage
Professor
Curriculum and Instruction

Louise Cherry Wilkinson
Associate Professor
Educational Psychology

Steven R. Yussen
Professor
Educational Psychology

11/79